TimeLink microsystems

IRIG-B Generator
TIB202

User Manual

Document reference : MN0430A

The information contained in this document could be subject of modifications without notice and would no in no manner engaging TimeLink Microsystems.
No part of this handbook can be reproduced transmitted by some means that it is, electronic or mechanical, including by photocopy, recording, filing or any other process of storage, treatment and recovery of information, for other goals that the personal use of the recipient, without the permission express and be written of TimeLink Microsystems.

© Copyright 2012 TimeLink Microsystems. All rights reserved.

EDITION	DATE	MODIFICATION
A	2012-09-09	Original issue

Customer Support: support@timelinkmicro
Web site: www.timelinkmicro/TIB
Phone: +33 (0) 5 62 87 10 70
Fax: +33 (0) 5 62 87 10 77

TimeLink microsystems
Z.I du chapitre
14, rue Jean Perrin
31100 TOULOUSE - France

TABLE OF CONTENT

1. INTRODUCTION 5

2. TIB HARDWARE 5

2.1 CHARACTERISTICS OF THE HARDWARE 5
2.2 SETUP OF THE TIB 6
2.3 TYPICAL USAGE 7

3. TIB MANAGEMENT SOFTWARE 7

3.1 INSTALLATION OF THE SOFTWARE 7
3.1.1 installation on Windows 7
3.1.2 installation on Linux 7
3.2 COMMON PART OF THE MANAGEMENT SOFTWARE 8
3.2.1 List of detected TIBs 8
3.2.2 Updating a TIB 9
3.3 SPECIFIC PART OF THE MANAGEMENT SOFTWARE 10
3.3.1 Configuration of a TIB for UT IRIG-B frames 11
3.3.2 Configuration of a TIB for CD IRIG-B frames 13
3.3.3 Configuration of a TIB for LT IRIG-B frames 14

TABLE OF FIGURES

Figure 1 – TIB202 aspect 5
Figure 2 - TIB Manager main window 8
Figure 3 - TIB Manager contextual menu 9
Figure 4 - TIB Updater main window 9
Figure 5 - TIB Updater after a file selection 10
Figure 6 - TIB Updater during an update 10
Figure 7 - TIB Updater after an update 10
Figure 8 - TIB 202 UT display 10
Figure 9 - TIB 202 CD display 11
Figure 10 - TIB 202 LT display 11
Figure 11 - TIB 202 UT configuration 12
Figure 12 - TIB 202 UT configuration with control flags 13
Figure 13 - TIB 202 CD configuration 14
Figure 14 - TIB 202 LT configuration 14

ABBREVIATIONS

TIB	Timing Box
1 PPS	One pulse per second
UT	Universal Time
CD	Countdown Time
LT	Launch Time

1. INTRODUCTION

The following document describes the usage of a TIB dedicated to IRIG-B Generation.

This generator is composed of a piece of hardware equipment and management software.

The document describes the characteristics of the hardware and its typical usage. Another section of the document describes how to install and use the management software to control the TIB Hardware.

2. TIB HARDWARE

This generator is part of the TIB family and has been assigned the model "202". In the rest of the document "TIB202" will refer to this hardware equipment.

2.1 CHARACTERISTICS OF THE HARDWARE

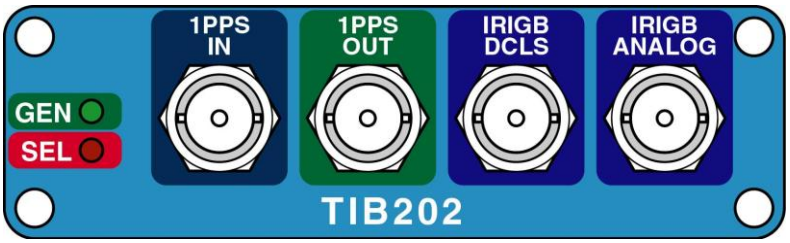
The TIB202 is a versatile IRIG-B Generator embedded in a small box according to the following image.

Figure 1 – TIB202 aspect

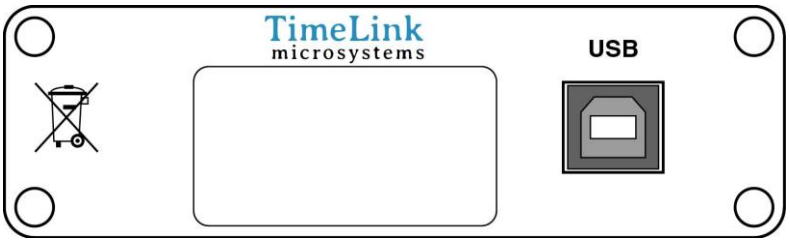
The TIB202 unit is able to generate the following signals:

- an analog modulated IRIG-B signal whose amplitude can vary from 0V to 7v.
- a DCLS IRIG-B signal (non modulated signal)
- a "1-PPS" output pulse generated in phase with the IRIG-B
- a "1-PPS" input pulse to phase the generated IRIG-B signal with an external reference

From a connectivity standpoint the TIB202 has 4 BNC connectors in front, one USB connector on its back and two LED in front.



Front panel



Rear panel

The green LED (GEN) indicates in an IRIG-B signal is generated or not.

The red LED (SEL) is lit when the management software is focused on this TIB.

The IRIG-B signals which can be generated are the following:

- an UT signal with the format B120 to B127 (respectively B000 to B007 for DCLS).
- a CD signal from -39:59:59 to +39:59:59 (pseudo IRIG-B)
- a LT signal (pseudo IRIG-B)

On the analog output the IRIG-B signal level can be controlled in amplitude from 0 volts to 7 volts (peak to peak on 600 ohms load) in 127 steps. The signal can be also grounded and so is not generated at all.

2.2 SETUP OF THE TIB

The TIB setup consists in plugging an USB cable into the TIB and into an USB port on a PC or USB hub.

The TIB is powered through the USB port and immediately starts to generate an IRIG-B signal using its default configuration:

- IRIG-B signal generated is a UT with a 122 format
- IRIG-B signal is generated at 4.0 volts
- time is running from 2012/001 at 00:00:00

2.3 TYPICAL USAGE

To use a TIB202 it is necessary to power it through its USB port. It is also necessary to configure it if the default configuration does not fit your needs.

The "1-PPS" output can be connected to another TIB into the "1-PPS" input. In that case the second TIB is synchronized by the first one.

3. TIB MANAGEMENT SOFTWARE

The TIB202 is managed by dedicated software running on the platform to which it has been connected. The supported platforms are:

- Microsoft Windows (XP to Seven)
- Linux

The following sections describe its installation and usage of this software in its version 1.1.

3.1 INSTALLATION OF THE SOFTWARE

The TIB202 management software is delivered as a "zip" archive that contains all software to manage several TIB202.

3.1.1 INSTALLATION ON WINDOWS

The TIB management software is just a "zip" archive that needs to be unzipped at any location in your Windows filesystem. To run the TIB management application you just have to execute the script "run_us.bat" or "run_fr.bat" to start the application in english or in french.

After unzipping the archive it is necessary to install the driver. To install the driver just plug a TIB202 into your PC. Windows will then asks for a driver for the TIB. Select the "TIB.inf" file supplied in the archive under the "driver " directory.

After a successful installation each TIB connected to your PC will appear as a COM port in the list of devices.

3.1.2 INSTALLATION ON LINUX

The installation is similar to the Windows one except for the driver part.

Each connected TIB on a Linux PC creates a device /dev/ttyACMx with x starting from 0. To be able to run the TIB management application the following constraints have to be respected:

- the user that executes the management application must have the right to write into the "/var/lock" directory.
- the user that executes the management application must belongs to the group whose "/dev/ttyACMx" belongs (usually "dialout").

The execution of the application is done using the script "run_us.sh" or "run_fr.sh" according to the language you have chosen.

3.2 COMMON PART OF THE MANAGEMENT SOFTWARE

The TIB management software has a part which is common to all equipment of the TIB family.

This part is in charge of identifying TIBs connected to the PC that runs the application and of updating TIBs.

The following picture is a snapshot of the main window where three TIBs has been identified.

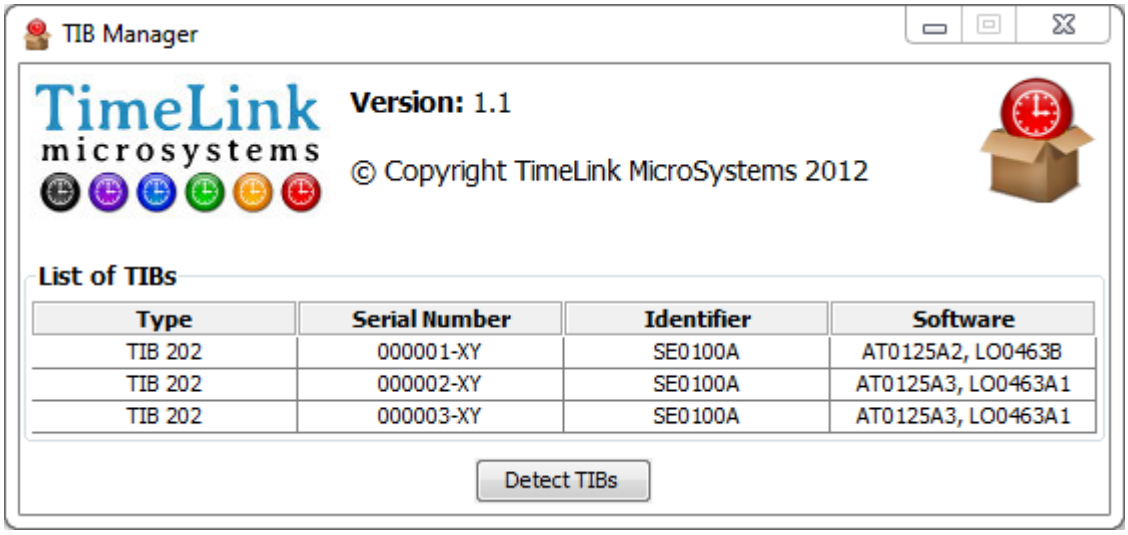


Figure 2 - TIB Manager main window

The upper part of the window contains two clickable images. The "TimeLink microsystems" image opens the web site of the "TimeLink microsystems" company and the TIB icon on the right opens the web site dedicated to the TIBs.

3.2.1 LIST OF DETECTED TIBS

The bottom of the window lists the TIBs that have been detected on the PC that executes the application. For each TIB its type, serial number, identifier and software is detailed.

Each line in the list can be selected individually and a contextual menu appears when a right-click is detected on the selected TIB.

The following image details the contextual menu for the TIB "000001-XY".

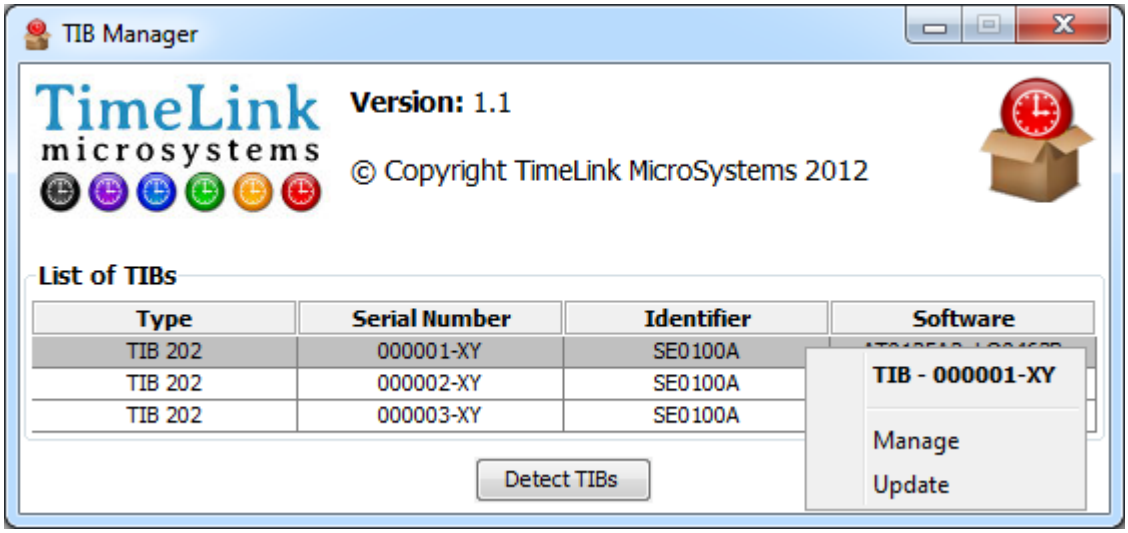


Figure 3 - TIB Manager contextual menu

The contextual menu allows each TIB to be either managed or updated.

The manage item will be detailed in the following section because it depends on the TIB type.

The update item allows the update of the TIB software.

3.2.2 UPDATING A TIB

To update a TIB it is necessary to obtain an update file from TimeLink Microsystems.

Generally an update file can be downloaded from the TIB specific site.

An update file has " .tib" extension and its name starts by the TIB type. Its content may be related to the AT or LO part of the TIB software.

"TIB202-AT0125A4.tib" is an example of an update file for TIB 202 that update the AT part of the TIB software.

When the "update" menu is selected a new window opens below the main window.

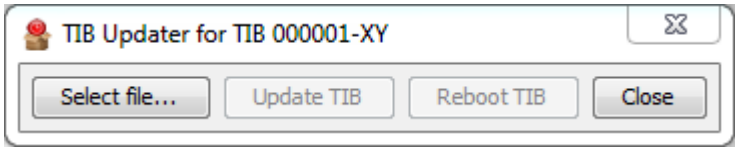


Figure 4 - TIB Updater main window

This window is modal to the application and must be closed before using again the main window.

Its title indicates which TIB is involved by the update.

The principle of an update is first to select a file to upload into the TIB then Update the TIB with the selected file.

When a file has been selected its name is indicated in the window title as a reminder.

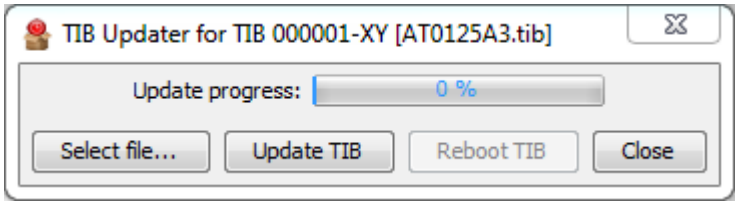


Figure 5 - TIB Updater after a file selection

After clicking "Update TIB" a progress bar appears and reflects the progress during the upload.

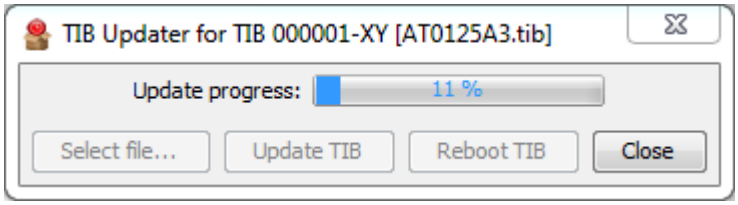


Figure 6 - TIB Updater during an update

At the end of the transfer a window appears indicating is the upload succeeded or failed with the cause of the failure.

You can repeat these two steps for each file to upload into the TIB. When all files have been uploaded click on "Reboot TIB" to restart the TIB with its new software.

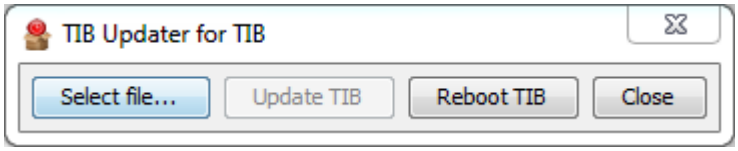


Figure 7 - TIB Updater after an update

The close button simply closes the window and reminds you to reboot the TIB if any file has been uploaded.

3.3 SPECIFIC PART OF THE MANAGEMENT SOFTWARE

The TIB management software has a specific part that depends on the TIB type detected. In this document we describe the specific part for the TIB202.

The management of a TIB202 is activated when right-clicking on a TIB in the TIB list and when choosing the "manage" menu item.

When this menu is activated the following window appears:

Figure 8 - TIB 202 UT display

This window reminds that the management is done on the TIB whose serial number is given in the title.

The content of this window depends on the mode that has been selected for the TIB. In the above picture we can see that the TIB is configured for generating a UT IRIG-B frame. The content reflects also any changes in the frame generation. Here the generated UT time changes every second.

Display is in orange when the time is stopped and in green when time is running.

The following images show the CD and LT modes.

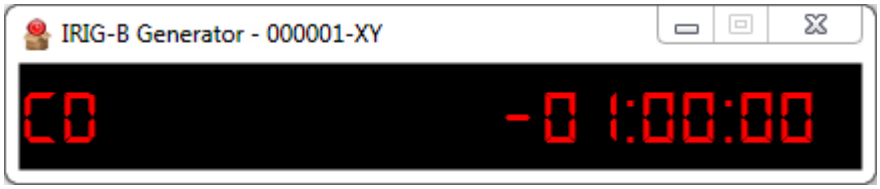


Figure 9 - TIB 202 CD display

Figure 10 - TIB 202 LT display

You can display one of these windows for each TIB listed in the main window.

Each of these windows allow the configuration of a TIB. To activate the configuration just double-click inside the window and the window will be expanded with controls to configure the TIB. Another double-click restore the window in its display mode.

3.3.1 CONFIGURATION OF A TIB FOR UT IRIG-B FRAMES

When you switch the display window in configuration mode you obtain the following window:

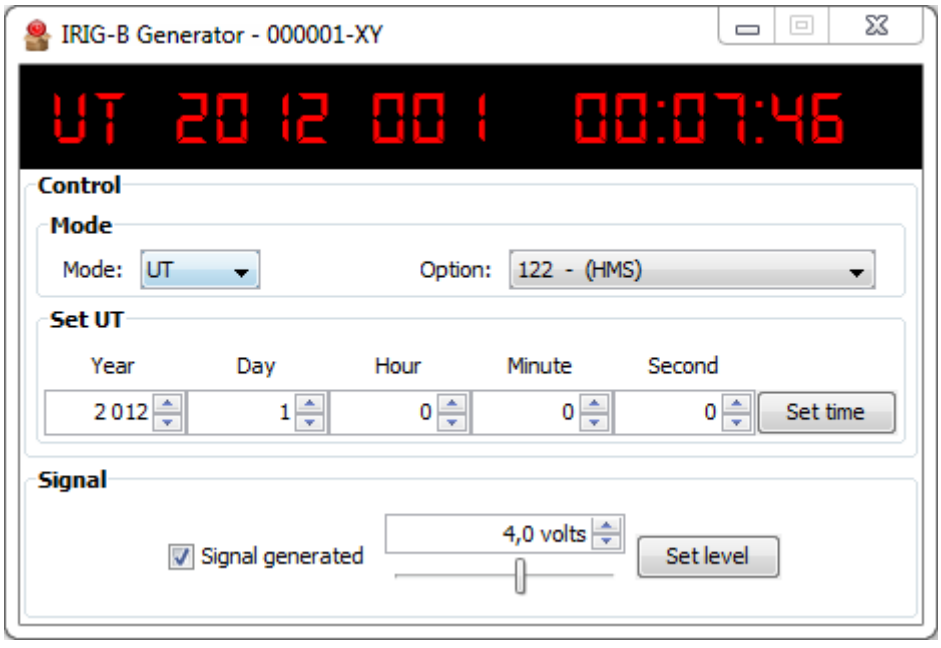


Figure 11 - TIB 202 UT configuration

In this window there are several areas:

- a display area where the generated "time" is displayed
- a control area where you can :
    - modify the generation mode and its option (for UT mode only)
    - set a new starting time
    - run or stop the time (for CD and LT)
- a signal area where you can:
    - activate or deactivate the signal generation
    - set the signal level between 0 and 7 volts

For the UT mode the possible options are:

- 120 (HMS, CF, SBS)
- 121 (HMS, CF)
- 122 (HMS)
- 123 (HMS, SBS)
- 124 (HMS, Year, CF, SBS)
- 125 (HMS, Year, CF)
- 126 (HMS, Year)
- 127 (HMS, Year, SBS)

where:

- HMS is Hour, Minute and Second and day of year
- CF is control flags (18 flags are defined)
- SBS is Straight Binary Time
- Year is the year

The "Set UT" panel allows to set a new starting time by selecting the year, day of year, hour, minute and second. Leap years are managed and constraint the maximum day of year.

After having selected new values you have to send them to the TIB by clicking on the "Set time" button. The new time is then set into the TIB and you see it in the display area.

The following image details the view when the "CF" are part of the options.

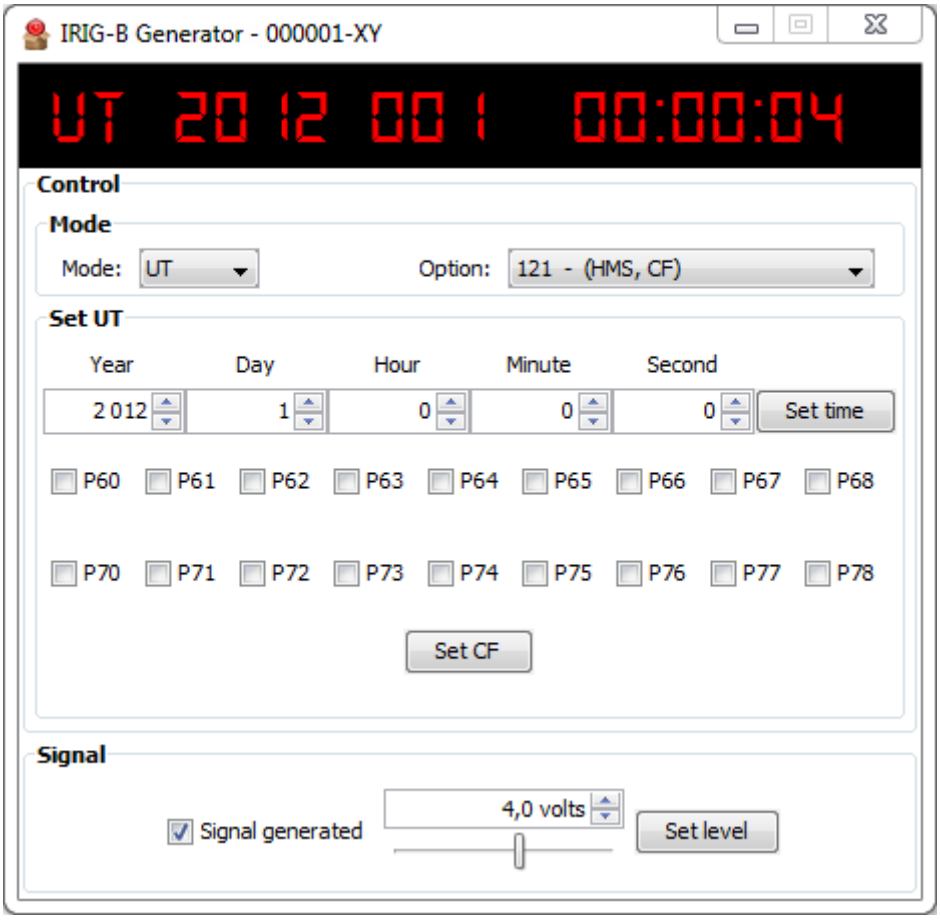


Figure 12 - TIB 202 UT configuration with control flags

In this case each CF is selectable as a checkbox and a "Set CF" button allows to send the new CF values to the TIB.

3.3.2 CONFIGURATION OF A TIB FOR CD IRIG-B FRAMES

The following image gives an overview of the configuration window for a TIB in CD mode. This mode is a pseudo IRIG-B because it is not part of the norm.

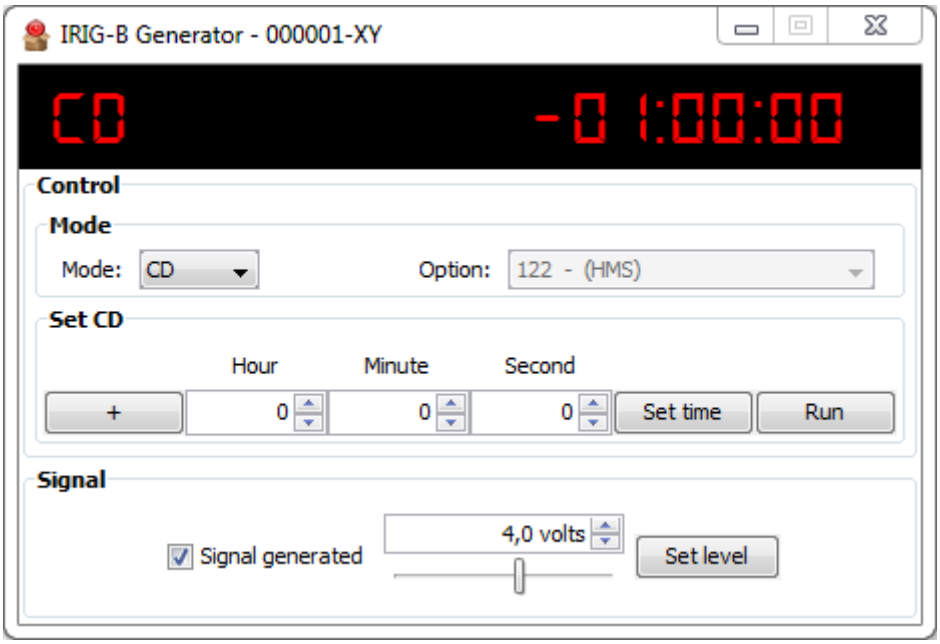


Figure 13 - TIB 202 CD configuration

In this window there are the same areas than in the UT configuration window except for the "Set CD" area where you can set the CD time and run or stop it.

The range for HMS is from "-39:59:59" to "+39:59:59".

3.3.3 CONFIGURATION OF A TIB FOR LT IRIG-B FRAMES

The following image gives an overview of the configuration window for a TIB in LT mode.

This mode is a pseudo IRIG-B because it is not part of the norm.

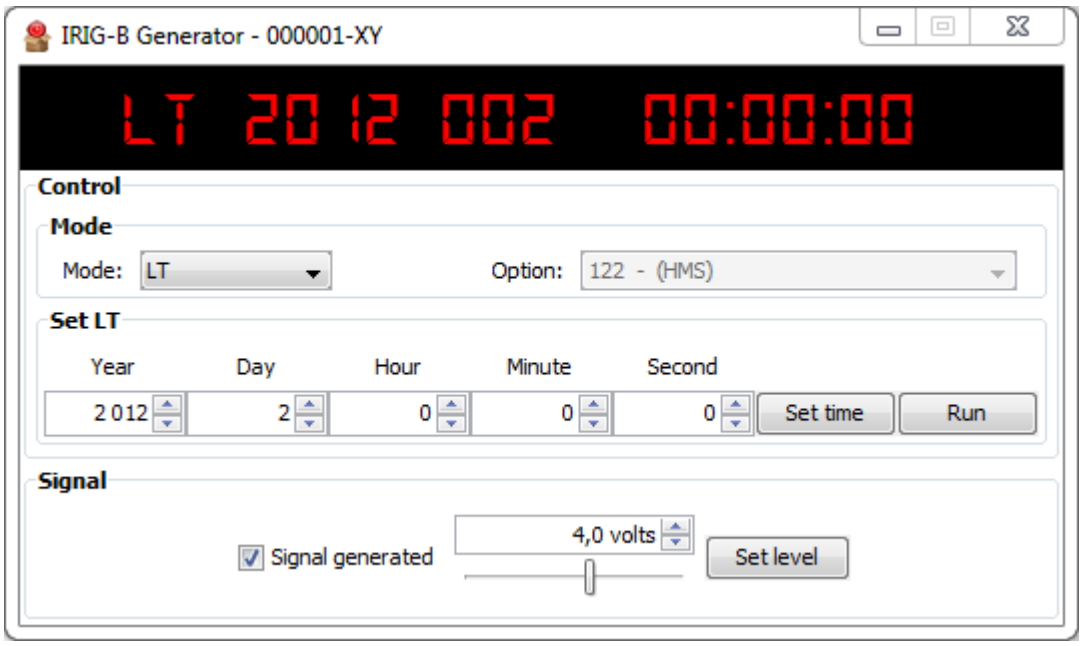


Figure 14 - TIB 202 LT configuration

In this window there are the same areas than in the UT configuration window except for the "Set LT" area where you can set the LT time and run or stop it.

Leap years are managed and constraint the maximum day of year.

NOTES:

Customer Support: support@timelinkmicro
Web site: www.timelinkmicro/TIB
Phone: +33 (0) 5 62 87 10 70
Fax: +33 (0) 5 62 87 10 77